WHAT IS CLAIMED IS:

1. An image forming apparatus comprising:

a scanning section which reads a document image and outputs image data representing the density of the read image for each pixel;

a pulse width modulating section which takes in as input the image data output from said scanning section and performs a pulse width modulating operation of generating and outputting a drive signal synchronized for one or more than one pixel of the image data and having a pulse width corresponding to the density of the one or more than one pixel, whichever appropriate;

a laser unit configured to be turned on and off according to the drive signal output from said pulse width modulating section and emit a laser beam during each on period;

a photosensitive drum;

a scanning section which linearly scans the surface of said photosensitive drum with the laser beam emitted from said laser unit along the axial direction of the photosensitive drum and repeating the linear scanning operation successively in synchronism with the rotation of said photosensitive drum;

a control section which shifts the number of pixels to be used for the pulse width modulating operation of said pulse width modulating section for each linear scanning operation of said scanning

section; and

a correcting section which corrects the image data output from said scanning section and input to said pulse width modulating section according to the input/output characteristics of the pulse width modulating section.

2. The apparatus according to claim 1, wherein said pulse width modulating section selectively performs a pulse width modulating operation of generating and outputting a drive signal with a pulse width corresponding to the density of a single pixel in synchronism with each of the pixels of the input image data, a pulse width modulating operation of generating and outputting a drive signal with a pulse width corresponding to the density of two pixels in synchronism with every two of the pixels of the input image data or a pulse width modulating operation of generating and outputting a drive signal with a pulse width corresponding to the density of three or more than three pixels in synchronism with every three or more than three, whichever appropriate, of the pixels of the input image data.

3. The apparatus according to claim 2, wherein said control section selects two of the pulse width modulating operation for a single pixel, the pulse width modulating operation for two pixels and the pulse width modulating operation for three or more than

three pixels and causes said pulse width modulating section to carried out the selected two pulse width modulating operations alternately, on a line-by-line basis, for the linear scanning operation of said scanning section.

4. The apparatus according to claim 1, wherein said correcting section corrects the image data input to the pulse width modulating section so that the drive signal that is output from the pulse width modulating section in response to the corresponding input of image data to the pulse width modulating section may be same as the imaginary output of a pulse width modulating section showing predetermined ideal input/output characteristics.

5. The apparatus according to claim 1, wherein said correcting section comprises a lookup table that stores image data input to the correcting section and the corresponding corrected image data that is supposed to be output from the correcting section and input to the pulse width modulating section.

6. The apparatus according to claim 1, wherein said scanning section has:

a document table configured to set a document;

an exposure unit configured to expose the document set on said document table to light;

a photoelectric conversion element configured to receive the image formed by the light reflected from

the document table and output an image signal showing a voltage level corresponding to the received image formed by the reflected light;

an A/D conversion unit configured to perform A/D conversion on the image signal output from said photoelectric conversion element and output corresponding image data; and

an image processing section configured to process the image data output from said A/D conversion unit and output the processed image data.

7. The apparatus according to claim 1, wherein said scanning section has:

a document table configured to set a document;

an exposure unit configured to expose the document set on said document table to light;

a photoelectric conversion element configured to receive the image formed by the light reflected from the document table and output an image signal showing a voltage level corresponding to the density of the red image, an image signal showing a voltage level corresponding to the density of the green image and an image signal showing a voltage level corresponding to the density of the blue image out of the received image formed by the reflected light;

an A/D conversion unit configured to perform A/D conversion on each of the image signals output from said photoelectric conversion element and output image

data R showing the density of the red image, image data G showing the density of the green image and image data B showing the density of the blue image; and

an image processing section configured to process the image data R, G, B output from said A/D conversion unit and output image data Y showing the density of the yellow image, image data M showing the density of the magentan image, image data C showing the density of the cyan image and image data K showing the density of the black image.

8. The apparatus according to claim 7, wherein

said pulse width modulating section selectively performs a pulse width modulating operation of generating and outputting a drive signal with a pulse width corresponding to the density of a single pixel in synchronism with each of the pixels of the input image data, a pulse width modulating operation of generating and outputting a drive signal with a pulse width corresponding to the density of two pixels in synchronism with every two of the pixels of the input image data or a pulse width modulating operation of generating and outputting a drive signal with a pulse width corresponding to the density of three or more than three pixels in synchronism with every three or more than three, whichever appropriate, of the pixels of the input image data.

9. The apparatus according to claim 8, wherein

said control section selects two of the pulse width modulating operation for a single pixel, the pulse width modulating operation for two pixels and the pulse width modulating operation for three or more than three pixels, in accordance with which one of the image data Y, M, C, K has been output from said image processing section and for causing the pulse width modulating section to carried out the selected two pulse width modulating operations alternately on a line-by-line basis for the linear scanning operation of said scanning section.

10. An image forming apparatus comprising:

a scanning means for reading a document image and outputting image data representing the density of the read image for each pixel;

a pulse width modulating means for taking in as input the image data output from said scanning means and performing a pulse width modulating operation of generating and outputting a drive signal synchronized for one or more than one pixel of the image data and having a pulse width corresponding to the density of the one or more than one pixel, whichever appropriate;

a laser unit configured to be turned on and off according to the drive signal output from said pulse width modulating means and emit a laser beam during each on period;

a photosensitive drum;

a scanning means for linearly scanning the surface of said photosensitive drum with the laser beam emitted from said laser unit along the axial direction of the photosensitive drum and repeating the linear scanning operation successively in synchronism with the rotation of said photosensitive drum;

a control means for shifting the number of pixels to be used for the pulse width modulating operation of said pulse width modulating means for each linear scanning operation of said scanning means; and

a correcting means for correcting the image data output from said scanning means and input to said pulse width modulating means according to the input/output characteristics of the pulse width modulating means.

11. The apparatus according to claim 10, wherein said pulse width modulating means selectively performs a pulse width modulating operation of generating and outputting a drive signal with a pulse width corresponding to the density of a single pixel in synchronism with each of the pixels of the input image data, a pulse width modulating operation of generating and outputting a drive signal with a pulse width corresponding to the density of two pixels in synchronism with every two of the pixels of the input image data or a pulse width modulating operation of generating and outputting a drive signal with a pulse width corresponding to the density of three or more

than three pixels in synchronism with every three or more than three, whichever appropriate, of the pixels of the input image data.

12. The apparatus according to claim 11, wherein said control means selects two of the pulse width modulating operation for a single pixel, the pulse width modulating operation for two pixels and the pulse width modulating operation for three or more than three pixels and causes said pulse width modulating means to carried out the selected two pulse width modulating operations alternately, on a line-by-line basis, for the linear scanning operation of said scanning means.

13. The apparatus according to claim 10, wherein said correcting means corrects the image data input to the pulse width modulating means so that the drive signal that is output from the pulse width modulating means in response to the corresponding input of image data to the pulse width modulating means may be same as the imaginary output of a pulse width modulating means showing predetermined ideal input/output characteristics.

14. The apparatus according to claim 10, wherein said correcting means comprises a lookup table that stores image data input to the correcting means and the corresponding corrected image data that is supposed to be output from the correcting means and input to the pulse width modulating means.

15. The apparatus according to claim 10, wherein said scanning means has:

a document table configured to set a document thereon;

an exposure unit configured to expose the document set on said document table to light;

a photoelectric conversion element configured to receive the image formed by the light reflected from the document table and output an image signal showing a voltage level corresponding to the received image formed by the reflected light;

an A/D conversion unit configured to perform A/D conversion on the image signal output from said photoelectric conversion element and output corresponding image data; and

an image processing means for processing the image data output from said A/D conversion unit and output the processed image data.

16. The apparatus according to claim 10, wherein said scanning means has:

a document table configured to set a document;

an exposure unit configured to expose the document set on said document table to light;

a photoelectric conversion element configured to receive the image formed by the light reflected from the document table and output an image signal showing a voltage level corresponding to the density of the red

image, an image signal showing a voltage level corresponding to the density of the green image and an image signal showing a voltage level corresponding to the density of the blue image out of the received image formed by the reflected light;

an A/D conversion unit configured to perform A/D conversion on each of the image signals output from said photoelectric conversion element and output image data R showing the density of the red image, image data G showing the density of the green image and image data B showing the density of the blue image; and

an image processing means configured to process the image data R, G, B output from said A/D conversion unit and output image data Y showing the density of the yellow image, image data M showing the density of the magentan image, image data C showing the density of the cyan image and image data K showing the density of the black image.

17. The apparatus according to claim 16, wherein said pulse width modulating means selectively performs a pulse width modulating operation of generating and outputting a drive signal with a pulse width corresponding to the density of a single pixel in synchronism with each of the pixels of the input image data, a pulse width modulating operation of generating and outputting a drive signal with a pulse width corresponding to the density of two pixels in

synchronism with every two of the pixels of the input image data or a pulse width modulating operation of generating and outputting a drive signal with a pulse width corresponding to the density of three or more than three pixels in synchronism with every three or more than three, whichever appropriate, of the pixels of the input image data.

18. The apparatus according to claim 17, wherein said control means selects two of the pulse width modulating operation for a single pixel, the pulse width modulating operation for two pixels and the pulse width modulating operation for three or more than three pixels, in accordance with which one of the image data Y, M, C, K has been output from said image processing means and for causing the pulse width modulating means to carried out the selected two pulse width modulating operations alternately on a line-by-line basis for the linear scanning operation of said scanning means.

19. A method of controlling an image forming apparatus, the image forming apparatus having:

a scanning section which reads a document image and outputting image data representing the density of the read image for each pixel;

a pulse width modulating section which takes in as input the image data output from said scanning section and performing a pulse width modulating operation of generating and outputting a drive signal synchronized

for one or more than one pixel of the image data and having a pulse width corresponding to the density of the one or more than one pixel, whichever appropriate;

a laser unit configured to be turned on and off according to the drive signal output from said pulse width modulating section and emit a laser beam during each on period;

a photosensitive drum; and

a scanning section which linearly scans the surface of said photosensitive drum with the laser beam emitted from said laser unit along the axial direction of the photosensitive drum and repeating the linear scanning operation successively in synchronism with the rotation of said photosensitive drum;

said method comprising:

shifting the number of pixels to be used for the pulse width modulating operation of said pulse width modulating section for each linear scanning operation of said scanning section; and

correcting the image data output from said scanning section and input to said pulse width modulating section according to the input/output characteristics of the pulse width modulating section.